equaled 1.0. In order for the ratio of price to marginal cost to be the same for AT&T's standard MTS plan, its marginal cost would have to equal 31 cents per minute. That is, AT&T's non-access marginal cost would have to equal 25 cents per minute for standard MTS and 9 cents per minute for *One Rate*, which requires credulity even beyond that required to believe Hubbard and Lehr cost estimates.

31. The point should be clear. AT&T offers an assortment of MTS plans for the express purpose of profitably exercising second degree price discrimination. This necessarily requires that AT&T have market power, since that is a precondition for the successful exercise of discrimination.[29] The ability of AT&T as well as MCI and Sprint to do so refutes the claim by Bernheim, et. al. that long-distance markets are competitive.

32. The presence of price discrimination is and has been used as a valid indicator of lack of market competitiveness for at least four decades. Judge Richard Posner, in his early landmark article on oligopoly, gave evidence on discrimination the paramount role in determining the presence of non-competitive market behavior.[30] Recently Professor Carl Kaysen of Harvard, in reviewing decades of work analyzing market behavior, listed price-cost margin behavior and the presence of discrimination as the two effective measures of lack of competition.[31] In long-distance markets, the increase over time in price-cost margins, while concentration has declined, has most clearly shown the results from the development among the three large carriers of a

---

[29] *See e.g.*, Carlton, D. and Perloff, J. (1994), MODERN INDUSTRIAL ORGANIZATION, New York, NY: Harper Collins College Publishers, p. 435.

[30] Posner, R. (1969), *Oligopoly and the Antitrust Laws* 21 STANFORD LAW REVIEW 1562-1587.

[31] Kaysen, C., *The Corporation: How Much Power? What Scope?* in THE CORPORATION IN MODERN SOCIETY (1959), ed. Edward S. Mason, Harvard University Press, Cambridge, MA) Note: "Whenever one particular good is priced high in relation to its cost while another is priced low, then too much of the first tends to be produced in relation to consumer demands. When the price-cost margin on a product remains high over a period of time, this is an indication of economic inefficiency. So is continued price discrimination . . . the lack of competitive pressure on margins may lead to inefficiency in the simpler sense of not producing with the minimal amount of resources possible" (p. 94).

tacitly collusive price formation process in the 1990s. The experts for the long-distance companies, responding to my affidavit, have sought to distract from these basic findings by pointing instead to the proliferation of standard and discount plans as evidence of competition, at least in interfirm non-price behavior. But the pattern of offerings where subscribers with higher volume usage rates pay lower relative prices is not so much competition for a select group of users as segmentation for purposes of charging both higher and lower prices. The association of discount plans with customers having higher demand elasticities, and the association of these plans with discounts not justified by cost savings, supports the argument that the three large carriers have divided consumers so as to systematically discriminate in ways that could only prevail if there were tacit agreement.

33. Given such observed discrimination, one should ask what would be the effect on consumers' welfare if the AT&T *One Rate* of 15 cents per minute were offered to all customers as part of its standard MTS plan. Suppose the standard plan customers were automatically moved to one-rate discount plans in the manner hypothesized by Bernheim, et. al. in their "Situation A."[32] Assuming AT&T has approximately 30 million standard MTS plan customers, and that their average long-distance bill is $10 per month, their current annual payments amount to $300 million. If they made one half of their calls during the daytime period and the other one-half during the night/weekend period, their price per minute would equal approximately 23.5 cents (see Tables One and Two). A price reduction to 15 cents per minute would decrease their annual payments to approximately $190 million (i.e., $0.15/$0.235 multiplied by $300 million), for a reduction in annual total payments of $110 million, lowering the average customer's monthly bill to approximately $6.38. Thus, a conservative estimate, based only on AT&T's customers, shows that elimination of discrimination in the rate structures of long-distance carriers by an infusion of competition would increase consumers' welfare by at least $100 million annually.

[32] Bernheim, Ordover, and Willig Affidavit, p. 87.

IV. WELFARE GAINS TO CONSUMERS FROM AMERITECH'S ABILITY TO OFFER IN-REGION, INTERLATA SERVICES

34. Professor Hall is the only long-distance company affiant to challenge my estimates of consumer benefits from Ameritech entry into in-region long-distance markets.[33] He does not provide an alternative estimate of benefits. Rather, he mischaracterizes my assumptions about interfirm pricing to make them sound unreasonable, and then says that his proposed assumptions would be more reasonable. There is no direct response possible to his interpretations of my interfirm pricing parameters (the coefficients of conjectural variation) other than to state that even his sentence structure is incomprehensible. What then can be done to be responsive? My approach is to go through the steps for estimating entry-induced benefits, pointing out the important assumptions and making clear their conservative nature.

[33] Hall Affidavit, pp. 83-84.

35. Table Six provides the steps to benefit estimation. Assuming first that incumbents in long-distance, in-region markets maintain their tacitly collusive practices, and that the price level current on all (short distance) in-region calls is 15 cents per minute, the reduction in seller concentration consequent upon entry causes price to decrease to 10.5 cents per minute.

TABLE SIX
KEY STATISTICS - AMERITECH REGION AND MICHIGAN
PRIOR TO AND FOLLOWING AMERITECH'S ENTRY INTO INTERLATA MARKET

		Post-Entry	
	Pre-Entry	Entrant Prices Non-Cooperatively but Incumbents Tacitly Cooperate in Pricing	All Carriers Price Non-Cooperatively
Ameritech Region Total:			
HHI	0.313	0.249	0.249
Price-Cost Margin	0.531	0.328	0.303
Price per Minute MTS ($)	0.150	0.105	0.101
Number of Conversation Minutes (billions)	37	46	47
Michigan:			
HHI	0.272	0.238	0.238
Price-Cost Margin	0.531	0.309	0.300
Price per Minute MTS ($)	0.150	0.102	0.101
Number of Conversation Minutes (billions)	8	10	10

Source: Pre-entry number of U.S. conversation minutes in the Ameritech region from FCC, STATISTICS OF COMMUNICATIONS COMMON CARRIERS, 1994/1995 Table 2.6.

The price reduction should bring about increases in message volume demanded from 37 billion conversation minutes to 46 billion conversation minutes, based upon a conservative assumption as to elasticity of demand.[34] The consumer welfare gains from lower post-entry prices and larger

[34] *See, e.g.*, Taylor, L. (1994), TELECOMMUNICATIONS DEMAND IN THEORY AND PRACTICE, Dordrecht, The Netherlands: Kluwer Academic Publishers, chapter six.

quantities demanded are shown in Table Seven; annual gains should come to $1.9 billion for the region as a whole and $442 million for Michigan. They represent a substantial share of $8.1 billion spent annually for interLATA calls originating or terminating within Ameritech's region. The present value of the total annual benefit stream from these annual gains, discounted at eight percent, is $23.5 billion in the region and $5.5 billion in Michigan alone.

TABLE SEVEN
CONSUMERS' WELFARE GAINS FROM AMERITECH'S
ENTRY INTO INTERLATA SERVICES

	Entrant Prices Non-Cooperatively but Incumbents Tacitly Cooperate in Pricing	All Carriers Price Non-Cooperatively
Annual Consumer Gain		
Total Region	$1.9 billion	$2.1 billion
Michigan	$0.4 billion	$0.5 billion
Present Value of Consumer Gain		
Total Region	$23.5 billion	$25.8 billion
Michigan	$5.5 billion	$5.7 billion

36. A realistic alternative assumption is that Ameritech's entry will increase competition – that it causes a breakdown of tacitly collusive behavior among the incumbent three large long-distance carriers. If the carriers act non-cooperatively following Ameritech's entry (i.e., become Cournot non-cooperative price setters), the price per minute of MTS service should decrease to 10.1 cents while the quantity demanded should increase to 47 billion conversation minutes (see Table Six). The consumer welfare gains that follow from these lower post-entry prices and larger quantities demanded, reported in the right-hand column of Table Seven, are estimated at $2.1 billion for the region as a whole and $457 million for Michigan. The present

value of the total annual benefit stream is estimated as equal to $25.8 billion in region and $5.7 billion in Michigan.

VII. CONCLUSIONS

37. The comments of the affiants retained by AT&T, MCI, and Sprint do not make the case that entry now by Ameritech in markets within region for long-distance services will decrease consumer welfare. Such a case is beyond credibility because it requires establishing a convincing argument that already non-competitive markets will become less competitive from the behavior of entrants. Any economist arguing that a firm should not be allowed to offer new services, because entry is not "competitiveness enhancing," must bear the proof for such an extraordinary claim. Ultimately, it is an empirical matter. The affiants retained by AT&T, MCI, and Sprint have chosen to become engaged in theoretical matters and not provide proof of any of their assertions on current competitiveness. Bernheim, *et al.* present no empirical work at all in their affidavit; the only data presented by Hall, and Hubbard and Lehr (i.e., their series for ARPM net of access costs) support my position, not theirs, that markets in the 1990s have become tacitly collusive.

38. What this comes to is that there is, given my analysis, an evident lack of competition in long-distance markets. Entry by Ameritech into long-distance service in its region is the most direct way to address that lack of competition for long-distance services in that region. Significant consumer welfare gains can be expected from Ameritech's entry, of the order at $1.9 to $2.1 billion annually, due to resulting prices resulting from entry in the five state service area. In Michigan alone, the estimated welfare gains could be $450 million annually. Such substantial benefits are ample evidence that entry is in the public interest.

* * *

I hereby swear, under penalty of perjury, that the foregoing is true and correct, to the best of my knowledge and belief.

Paul W. MacAvoy

Subscribed and sworn to before me this 2nd day of July, 1997.

Judith Ratti 7-2-97
Notary Public

My commission expires: 9-30-02

APPENDIX

APPENDIX
RESPONSES TO SECONDARY ISSUES

This Appendix addresses specific questions and criticisms of my affidavit by expert affiants for the long-distance companies. While there are criticisms of my work to be found in the briefs of AT&T, MCI, and Sprint, most refer to specific statements of their economic experts as their source. My responses are directed to these experts in the order which they were offered.

While this approach is less logical than that in Appendix A of my initial affidavit, where I addressed the same criticisms by eleven topic areas, it is undertaken for two reasons. The logically ordered approach, by subject, was ignored by respondents, most likely because their names were not mentioned in the arguments. Put their names in front and they read it. Second, there is a cumulative result from starting with Bernheim, *et al.*, proceeding through Hubbard and Lehr, Hall, and Banks. By taking them in order, one concludes that they all have only one argument, to the effect that price behavior should not be used to assess market competitiveness in long distance. Instead, company revenue should be used for that purpose. This approach ignores prices and never questions whether I estimate accurately the prices that subscribers actually pay for making long-distance calls. This is a losing proposition in economics and can only be explained by these experts' devotion to their clients' position of resistance to competitive entry in their markets.

I. ANALYTICAL ISSUES IN THE AFFIDAVIT OF BERNHEIM, ORDOVER, AND WILLIG

1. *The competitive role of resale* (Bernheim *et al.*, p. 74). The authors agree with me that WATS prices of the large interexchange carriers determine prices on resale to retail consumers charged by resellers using WATS services as their raw material; if WATS

prices are competitive then, with a cost-based retail margin imposed by competition among many resellers, there would be a competitive retail price for MTS services. Bernheim *et al.* argue that the prices paid by resellers are competitive because they are contract prices while "the WATS prices that MacAvoy tracks are not the contract prices charged to large customers of bulk wholesale services." Resellers use different types of services purchased from facilities-based, long-distance carriers. Small resellers purchase Combined Services, such as AT&T's *Uniplan*, MCI's *Vision*, and Sprint's *Clarity*. Medium-sized resellers purchase Virtual Network Services, such as AT&T's *OneNet*, MCI's *WorldNet*, and Sprint's *VPN Premier*. Large resellers use contract tariffs. Prices and price-cost margins on Combined Services and Virtual Network Services are not competitive (see my Affidavit and Chapter Five of my book, THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-DISTANCE TELEPHONE SERVICES, Washington, D.C.: MIT Press and AEI Press). There is no evidence that large resellers purchase at competitive prices, or that there are so many of them as to affect the margin of wholesale to retail prices. That is, resellers have not had a sufficient competitive impact to lower the price-cost margins shown in Tables One to Four of my Reply Affidavit.

2. *Bernheim et al. argue that "prices differ across retail customers based on calling volume."* (Bernheim *et al.*, p. 75; referring to MacAvoy Appendix A, pp. A-36 to A-37.) The Bernheim *et al.* argument is that "low-volume customers must pay higher prices because the non-volume-sensitive costs associated with their accounts have to be recovered over fewer minutes." Bernheim *et al.* claim that I fail to dispute this point, but they have offered nothing to dispute. Their report contains no empirical evidence to support their alleged pattern of non-volume-sensitive costs, or that these costs exceed ten cents per minute (see part III of my Reply Affidavit). Their evidence would have to indicate that the variation in those costs matches the variation in prices paid by high- and low-volume customers. They have not even explained the cost allocation procedure they

use to assign the non-volume-sensitive costs to specific customer classes. In sum, their claim is simply speculation.

3. *Bernheim et al. argue that price-cost margins should not be used to test for competitiveness.* (Bernheim *et al.*, pp. 83-86.) Their argument is to the effect that competitive prices are set equal to average costs including both marginal and fixed costs. This fails the Economics 10 midterm true-false section unless answered "false." Regardless of changes in fixed cost, price and output remain unchanged for the firm in a competitive market because that firm already has set its maximum profit output. As any textbook puts the issue: "When a firm's fixed cost increases, its profit-maximizing price and output remain completely unchanged, so long as it pays the firm to stay in business."[1]

4. *Barriers to entry* (Bernheim *et al.*, pp. 75-76). The authors argue that there are no sunk cost barriers to entry because potential entrants can determine the commercial success of their venture through reselling and then sink costs only if that determination shows success. The first difficulty is that resellers incur sunk costs in advertising, market research, the measurement and service structure that cannot be recovered if the firm exits the market. Bernheim *et al.* further state that if a reseller later invests in its own network facilities, these sunk investments should not be considered costs of entry because the firm has already entered the market. But these investments are anticipated on entry to be sunk later and so create a barrier to entry into the provision of facilities-based service.

5. *Bernheim et al. state that "AT&T's market share has eroded rapidly since divestiture; while this process has slowed somewhat in the 1990s, AT&T has continued to*

[1] Baumol, W. and Blinder, A. (1997), ECONOMICS, PRINCIPLES AND POLICY, 7th ed., The Dryden Press, p.197.

lose an average of two percent of the total market each year . . . these trends are indicative of a market in which the incumbent firms are battling to hold their positions against an army of aggressive newcomers. . . ." (Bernheim *et al.*, pp. 76-77.) With respect to market concentration, my central point is that market concentration has declined in the past decade, which no one disputes. The questions of market share stability and the combined share of non-big three carriers raised by Bernheim *et al.* are more problematic but are of distinct secondary importance. The fact is that the shares of the big three have stabilized with respect to each other insofar as the percent of minutes transported on carriers' networks is concerned. The difficulty is that we cannot observe the percent of total minutes for a given service that is transported on AT&T, MCI, and Sprint's facilities; instead we observe carriers' percent of sales and that picks up resellers using the facilities of the big three carriers. But the authors go on to state that "MacAvoy's factual claim concerning the stability of shares among the big three firms is totally erroneous" because if AT&T is losing "net share to the non big three firms while MCI and Sprint are holding steady," then "AT&T's share of big three business is necessarily declining." Actually, Bernheim *et al.* are wrong; AT&T's share of big three business has remained nearly constant, as shown in Appendix Table One. The big three carriers as a group have lost share to resellers, who often use the facilities of the big three carriers (see Appendix Table Two) But among themselves, AT&T, MCI, and Sprint have maintained stable shares, as shown in Appendix Table One.

APPENDIX TABLE ONE
MTS MARKET SHARES IN AMERITECH'S REGION
(SHARES OF BIG THREE CARRIERS' ORIGINATING MINUTES)

Year	AT&T	MCI	Sprint
1989	68.2	20.9	10.9
1990	67.0	22.2	10.8
1991	68.2	21.7	10.2
1992	67.7	22.7	9.5
1993	67.8	22.6	9.7
1994	68.5	21.7	9.9
1995	69.1	21.7	9.2
1996	68.7	21.9	9.5

APPENDIX TABLE TWO
MTS MARKET SHARES IN AMERITECH'S REGION
(SHARES OF ALL ORIGINATING MINUTES)

Year	AT&T	MCI	Sprint	All Others
1989	60.1	18.4	9.6	11.9
1990	59.0	19.6	9.5	11.9
1991	60.4	19.2	9.0	11.4
1992	59.6	20.0	8.4	12.0
1993	59.2	19.6	8.5	12.7
1994	58.8	18.6	8.5	14.1
1995	58.3	18.3	7.8	15.6
1996	55.2	17.6	7.6	19.6

6. *The implications of changes in concentration* (Bernheim *et al.*, p. 78). The authors state that "in reclassifying AT&T as non-dominant the FCC explicitly considered and rejected the assertion that the alleged 'stabilization' of long-distance market shares is indicative of market power." Also, Bernheim, *et al.* say that the FCC found that "the decline in AT&T market share suggests that AT&T no longer possesses market power." It is not economic analysis to quote the FCC as the source of analytical findings to the FCC. What if the analytical findings are incomplete or incorrect? Here they are irrelevant. In the sourced reference, the FCC states explicitly that their tests are for AT&T's monopoly power not whether AT&T has engaged in tacit collusion. (FCC, *Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier*, 11 FCC Rcd. 3271 (1995).)

7. *The competitive significance of non big three vendors* (Bernheim *et al.*, p. 78). Bernheim *et al.* claim to have offered "compelling evidence concerning the powerful competitive role of non-Big 3 firms." (Bernheim *et al.*, p. 78.) The "evidence" consists of a series of statements regarding carriers' market shares and investment analysts' reports. Market shares alone cannot demonstrate competitiveness; and investment analysts reports are, if possible, less useful. If Bernheim *et al.* wanted to show that non-big-three carriers have a powerful competitive role, why did they not examine the effect of those smaller carriers on the prices charged by AT&T, MCI, and Sprint? That is, the only available evidence conclusively shows that non-big-three carriers have had no ability to prevent the big three carriers from charging progressively higher prices and earning higher margins.

8. *Bernheim et al. also claim that my treatment of the competitive significance of non-big-three carriers is inconsistent with my previous statement that when MCI and Sprint had relatively small market shares, they had a greater incentive to capture share from AT&T, but that incentive to engage in price cutting declined as their shares increased.* (Bernheim *et al.*, p. 79.) There is no inconsistency: MCI and Sprint were (and

continue to be) nationwide, facilities-based carriers. In contrast, out of the many non-big-three carriers (the vast majority of which are resellers), only one (WorldCom) has nationwide facilities. As a group, non-big-three carriers have had limited capacity to take share – one percent per year – from the three largest carriers. And they have done so taking as given the price-cost margins set by AT&T, MCI, and Sprint and increased each year.

9. *MacAvoy's refusal to provide price data* (Bernheim *et al.*, p. 82 *et seq.*) The authors state that "MacAvoy and the RBOCs have, throughout the course of the debate spanning our combined writings and submissions on this issue, steadfastly refused to release the data and programs used in his analysis." (Bernheim *et al.*, p. 82.) I received a call from Professor Willig in the early summer of 1996 in which he requested that I provide the data, programs, and index series on tariff prices used in my MIT Press manuscript. I stated that the tariff data and software programs for calculating a price index were the property of HTL Telemanagement, a for-profit corporation that sold them to companies seeking information on the prices they paid for calls. I informed him that to replicate my series required only that he instruct HTL to generate my price indices from my calling profiles. My intention was to make clear that he could purchase the resulting full MacAvoy price series from HTL for a modest fee. My understanding from the owner of HTL Telemanagement, Dr. Michael Hills, is that Professor Willig never contacted him. In addition, I proposed that Professor Willig request of AG Economics that they provide him with a disk of my price index series (not the underlying contract data itself which they did not own). Professor Willig called AG Economics to request these price indices; in their response they stated willingness to comply with his request upon receipt from him of that request in writing. He never replied. Some weeks later, Mr. Gregory Sidak of the American Enterprise Institute, called me to request that I provide Professor Willig with my price index series as a personal favor; this was because he considered that, regardless of

the fact that AT&T was funding the Professor Willig book, it could have academic merit. My response to Mr. Sidak was to remind him that my entire price index series were published as appendices to the Yale School of Management working paper (No. 44) that contained the MIT Press manuscript, plus more complete tables than MIT was going to publish. I do not know whether Mr. Sidak communicated that information to Professor Willig, but no reasonable person could consider my response as "steadfastly refusing the data and programs used in my analysis."

The authors go on to state that "the issue here is simple: either MacAvoy and the RBOCs have something to hide or they do not" (Bernheim *et al.* p. 83.) I do not have anything to hide. This series of statements by Professor Willig constitutes mischaracterization of my position, and use of exaggeration, to create a false and misleading depiction of my response to his request. By falsely accusing me of unethical behavior, he undermines the credibility of his affidavit.

10. *Bernheim et al. conclude that "if the outcome in the long-distance industry approximates that of a contestable market, one would expect to see price-cost margins rise over time."* (Bernheim *et al.*, p. 84.) Despite their dramatic conclusion that the "importance of this observation cannot be overestimated," they offer no evidence to support it. In particular, their key assumption that "it is quite likely that fixed costs have been rising over time – particularly relative to marginal costs – in the long-distance industry" receives no empirical support. More fundamental, even if they did show that fixed costs have increased, their theory that fixed costs increase competitive prices remains to be tested in any market. Moreover, if one accepted, *arguendo*, that prices must equal or exceed average cost in order for firms to compete, Bernheim e*t al.* offer no evidence that prices equal but do not exceed average cost. In particular, they offer no evidence that the high and increasing price-marginal cost margins documented in my Affidavit are

consistent with prices equal to average cost. This vacuum has been pointed out to them before; their response has been to repeat themselves. (Bernheim *et al.*, pp. 83-86.)

11. *Bernheim et al. describe a first "pivotal disagreement" regarding the appropriate treatment of discount plans.* (Bernheim *et al.* pp. 87 *et seq.*) They hypothesize three situations involving standard and discount plans. Situation A is one in which all customers switch from standard service to a discount plan having a lower price, which is equivalent to the effect of a reduction in the standard tariff rate with all subscribers continuing standard service. Bernheim *et al.* correctly describe this as a reduction in price. Situations B and C involve the introduction of discount plans all having prices of 20 cents per minute. Twenty five percent of the customers remain on the standard plan, and the discount plans attract seventy five percent of the customers. Bernheim *et al.* conclude that price has fallen as a result of the introduction of the three discount plans. But this would be news to the twenty five percent of customers who remained on the standard plan. In these situations the discount plans are clearly differentiated in unspecified ways from the standard plan. An analogy may be made to time-of-day pricing in the electric utility industry. When lower off-peak prices are introduced, has the price of electricity fallen? The answer is yes for customers who can arrange to shift their usage to off-peak periods costlessly, but no for customers who cannot. In the examples offered by Bernheim *et al.*, the twenty five percent of customers who do not find the terms and conditions of the discount plans desirable receive no reduction in price. Even the seventy five percent who switch may not realize price reductions holding quality constant because they have to rearrange their calling patterns, e.g., in *Sprint Sense* subscribers must place calls at off-peak times, defined as 7:00 p.m. to 7:00 a.m. Monday through Friday and all day Saturday and Sunday, in order to receive discounts off the standard MTS rate. The price decrease they receive is not the announced price difference between the two plans, but the difference minus their unit cost increase from having to choose the new plan.

12. *Bernheim et al. describe a "pivotal disagreement" they have with my affidavit regarding the appropriate treatment of discount plans.* (Bernheim *et al.* pp. 89 *et seq.*) Bernheim *et al.* argue (p. 89, note 128), that market "segmentation" reflects an intensification of competition in the high-volume segment, and a pattern of (cost justified) price increases in the low-volume segment. This argument is supposedly supported by two factual inferences: (1) the FCC has shown that the "best available prices for high volume customers have been declining extremely rapidly" (p. 90); and (2) regulation continues to constrain AT&T's ability to increase prices for MTS customers (p. 91). With respect to (1), Bernheim *et al.* would use prices from different discount plans to create a price series which, of course, is not a price series for a uniform product unless all customers switch without delay to the newest plan. Switching from standard or other discount plans to new plans is not costless: all plans have specific, different benefits and/or disadvantageous requirements; the switching process involves transaction costs; and one can encounter higher prices upon switching (e.g., AT&T's *One Rate* plan is three cents per minute higher than its *True USA* plan on nights and weekends). The logic of Bernheim *et al.* would suggest that older plans do not count, despite the fact that there are a large number of customers on such plans. Thus, the FCC "best available price" is misleading when used as an indicator of a consumer price index over time. With respect to (2), it is at issue whether regulatory constraints on AT&T prices have or have not been removed. As stated in the FCC Order, AT&T voluntarily agreed to offer two optional MTS plans, but made no commitments with respect to its standard MTS rates. Specifically there are no cost-based limits on AT&T's standard MTS rates and this large carrier could increase rates to any extent it found profitable. Bernheim *et al.* fictionalize a process whereby AT&T stops using its power to set prices so that low-volume prices equal average costs.

There is a much more direct explanation that requires no more facts. As regulation has loosened controls over all rates, those that have increased rates have been more profitable because of low elasticities of demand while those that have been reduced have also been more profitable because of high elasticities of demand. This is another pattern of the price discrimination discussed in my Reply Affidavit.

13. *MacAvoy's price indices* (Bernheim *et al.*, paragraph 190 *et seq.*, p. 95). The authors state that "MacAvoy's analysis inherently recognizes no price reductions resulting from migration of customers into discount programs or from migration of customers through an increasingly aggressive sequence of discount programs" (p. 96). This is because migration is not costless and thus programs are differentiated. Discount programs differ from standard programs on a number of dimensions, some of which are limiting, others of which require front-end payment, and others of which have aspects of long-term contracts. An offer of lowest new program prices is not equivalent to a reduction in the standard tariff rate. While it may be appropriate for some customers to leave standard plans for discount plans, even for them the difference in program prices are not equivalent to a reduction in those customers' price. The correct procedure is to examine any one plan's price for a determined period, and to ask whether there have been price reductions in the Lerner Index consistent with increased competition, and then go on to apply that procedure with other plans.

14. *The significance of AT&T's One Rate Plan* (Bernheim *et al.*, p. 96 *et seq.*) Bernheim *et al.* argues "the most blatantly invalid portion of MacAvoy's affidavit is point seven" (referring to Appendix A, p. A-35 of my initial affidavit). My conclusion in point seven of Appendix A to my initial affidavit was that since the *One Rate* plan calls for a 15 cent per minute price and ARPM was 13.5 cents per minute, the *One Rate* plan involved a price increase for anyone paying ARPM (a hypothetical statement since no one actually

ever pays ARPM). Bernheim *et al.* argue that "it did not represent a price increase for customers (paying less) because they were free to stick with their original plans." But that is just the point. For those for whom ARPM was a "valid" representation of price, the 15 cent *One Rate* was a less preferred alternative or, in effect, offered only a price increase, since this was in some sense an "average" for both the *One Rate* and the ARPM universe. It did not constitute a market wide improvement in transaction charges to customers.

15. *Bernheim et al.'s claim that One Rate plan was "significant because of its simplicity"* (Bernheim *et al.*, p. 97). Bernheim *et al.* argue that the *One Rate* plan was "significant" because "some customers may have had access to lower rates prior to the introduction of *One Rate* but may not have enrolled because they did not understand or could not predict the benefits." That is, again, the point. Discount plans are not perfect substitutes in their offerings, and many are not comparable to standard tariff rate plans in simple terms that are attractive to subscribers. Because of their complexity in price and other terms, they can and many times are considered to be inferior by enough not to justify accepting the lower rate.

16. *Specific Issues Concerning Costs* (Bernheim *et al.*, par. 200 *et seq.* p. 97). Bernheim *et al.* make a number of points concerning my measure of marginal costs, none of which is valid. They are as follows. *While using total switched access charges for conversation minutes corrects the adjustment on conversation minutes, it does not adjust for compositional effect.* (Bernheim *et al.* p. 98.) Adjustments for compositional effects are not possible; therefore, the choice is between not including access charges in marginal costs or using a non-adjusted access charge series. *Since non-access cost components are (assumed) constant, the procedure is equivalent to ignoring all costs other than access.* (Bernheim *et al.*, p. 99.) It cannot be, unless the rate of change in the non-access cost component is negative. As a result of technical change in optical and switching systems, it

is probable that the rate of change is indeed negative. Then this "ignoring" process understates the substantial positive increase in the price-cost margin or Lerner Index in the last twelve years. *MacAvoy excludes a variety of variable expenses, such as customer service, billing, fraud, marketing, and so forth.* (Bernheim *et al.*, p. 99). None of my critics has suggested that these direct but non-traffic-sensitive costs would, if incorrectly included in marginal costs, come to more than one-half of the current marginal cost of network operations. For example, in 1994 advertising outlays for AT&T, MCI, and Sprint were 44 percent of the total cost of network operations; if one half of these outlays were marginal, then (the weighted-average for the three companies together) marginal cost would be increased 0.2 cents per minute. (*See* MacAvoy, P. (1996), THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-DISTANCE TELEPHONE SERVICES, Table 1-2, Revenues and Costs of Major Long-Distance Carriers as Reported, 1994.) *The Dorfman Steiner Theorem.* They mischaracterize the theorem by stating that it "relates a monopolist's advertising expenses to its margins." They go on to say, however, "firms may choose to advertise in a zero-profit, monopolistically competitive equilibrium," a statement goes nowhere, and then they lapse into fallacy by stating "if fixed costs rise (as we have argued is the case in long distance), advertising may rise as well, without any increase in the level of economic profit." This is not Dorfman Steiner but a piece of erroneous theory of fixed cost pricing to the effect that an increase in fixed costs drives up the prices. The problem with all this *ad hoc* theorizing is that it misses the point in Dorfman Steiner, that high and increasing price-cost margins cause an increase in advertising and marketing outlays per dollar of revenues.

17. *Other measures of competitiveness: the use of Tobin's q* (Bernheim *et al.*, par. 215 *et seq.*, p. 102). There is agreement that there are substantial difficulties in estimating Tobin's q for AT&T, MCI, and Sprint and then using that ratio as a measure of excess profitability from the exercise of market power by those three interexchange carriers. But,

Bernheim *et al.* make such an attempt, even though they have none to reply to. They begin their assessment of the measurement problem by arguing that "there is no particular reason to believe that evidence based on q is systematically biased." They may not have a particular reason, but the issue is whether biased or unbiased estimation errors in the denominator are so large as to result in q values that are unacceptably inaccurate. Bernheim *et al.* go into their accustomed illogic – q is difficult to measure, but so are other measures – but the task is not to estimate other measures but to make a case for the reliability of q. They go further to prejudge that, even though AT&T is a conglomerate, the usefulness of an estimate of q as a measure of market power in long-distance services alone need not be reduced; this is because "values of Tobin's q below unity for any activity must be transitory" with the implication that the estimated value for company-wide q must be due only to positive results in the exercise of power in interexchange markets by itself. But how transitory is that? AT&T has had a ten year record of mistaken investments, on a massive scale, that have absorbed excess profits in long distance one by one in two or three year periods. Few other companies could have held off the disasters in the NCR acquisition and, without bankruptcy (q going to zero); AT&T managed to absorb these management mistakes by increasing its earnings in long distance through the establishment of tacit collusion in those markets. It is sophistry to say that "one can be reasonably confident that q is not significantly greater than unity for any large component of the firm's activities" (Bernheim *et al.*, par. 218, p. 103) when looking at the history of large scale investment projects, and the resulting trivestiture, marking this company. The conclusion has to be that any q estimate from AT&T data has to be the result of investors' assessment of the company as a whole, not of domestic interLATA, long-distance competitiveness.

18. *MacAvoy's most recent submission shows that Sprint's discounted prices are well below AT&T and MCI's.* (Bernheim *et al.*, par. 232, p. 109). As shown in my Reply

Affidavit, neither the *Sprint Sense* nor *Sprint Sense Day* plans have prices below AT&T's *One* Rate plan or *MCI One* plans.

II. R. GLENN HUBBARD AND WILLIAM H. LEHR AFFIDAVIT: CRITIQUE AND RESPONSE

Professors Hubbard and Lehr's ("H&L") criticisms of my work largely duplicate those of Bernheim *et al.* Only when they make new points or add to a previously addressed point do I respond to their affidavit.

1. *"Long-distance markets are already effectively competitive; additional entry, therefore, will not make them meaningfully more competitive."* (H&L, p. 47.) H&L assume what is not in evidence: that long-distance markets are effectively competitive. My evidence on declining concentration and rising price-cost margins in long distance shows to the contrary that competition has been declining in the 1990s. Their proof lies in demonstrating that the average revenue per minute (ARPM) has declined. As a threshold matter, I demonstrate in my Affidavit that their ARPM net of access costs (H&L, Figure 3) as a measure of price-cost margin has increased over the 1984 to 1996 period. Even given the questionable accuracy and usefulness of their (secret) data, their empirical measure indicates again that, as concentration declined, margins increased.

They assume that markets are competitive to establish that entry by Ameritech would not make them "meaningfully more competitive." But why even raise the issue? Firms enter markets where returns are above the competitive level; the concentrated effort of the Regional Bell operating companies to enter long distance makes no sense unless there is at the present time extensive non-competitive pricing by AT&T, MCI, and Sprint in these markets. If competition were effective and profits could not be earned, as H&L

claim, price-cost margins would be at competitive levels, which they are not, and the Bell operating companies firms would not be putting forth the major efforts and expenditures we see today to enter long-distance markets.

2. *H&L allege that I have undertaken "a static analysis of a hypothetical and short-run price decline in long-distance services"* in examining the welfare effects of Ameritech's entry. (H&L, p. 49, note 71.) My price and price-cost margin data extend for over a decade, which is neither static nor a short-run period. They further their claim by stating that welfare changes cannot be made "without taking into account long-run price trends in long distance *and* local exchanges. . . ." (H&L, p. 49, note 71.) There is no analytical foundation for associating any change in local exchange prices with entry into long distance by a regional Bell operating company. It would be more productive to associate entry into automobile production with the price of tires.

3. *H&L conclude that "evidence of stable market shares is thought of [by me] as a potential consequence of collusion, not as a pre-condition for collusion."* (H&L, p. 63.) My theory of tacit collusion does not depend on share stability being established first. (*See* Orr, D. and MacAvoy, P. (1965), *Price Strategies to Promote Cartel Stability*, 32 ECONOMICA 186.) In criticizing my conceptual framework, which they misrepresent, H&L cite evidence that AT&T has continued to lose market share since 1989 "and the loss in market share has not been captured entirely by MCI and Sprint." (H&L, p. 63.) That has been my point all along – MCI and Sprint have not gained at the expense of AT&T, as would be observed if they were reducing prices to gain share.

4. *H&L also comment on my claim that the tariffing process facilitates the exercise of tacit collusion by making firms' prices public even before they take effect.* (H&L, p. 65.) H&L argue that this point was rebutted in Bernheim and Willig's manuscript; but

Bernheim and Willig merely noted my earlier comment that some services are subject to less stringent tariff reporting requirements than MTS, so that it is relatively more difficult to monitor prices for those services. This, of course, in no way vitiates the point that the tariffing process does facilitate the exercise of tacit collusion for services such as MTS, WATS, 800, and combined services. Nor was this point addressed by Bernheim and Willig.

5. *H&L allege that "MacAvoy's analysis overstates price-cost margins."* (H&L, p. 65.) This discussion repeats the criticisms in Bernheim *et al.* H&L, however, allege that "the inter-LATA price series were computed by HTL Telemanagement assuming an unsubstantiated calling pattern." (H&L, p. 66, note 83.) My affidavit provides the calling pattern; H&L need only request from HTL Telemanagement the specifications in the table in my affidavits and HTL Telemanagement will replicate my price indices for them. H&L also make the statement that "MacAvoy chose not to make his data available." (H&L, p. 66) H&L never requested these data from me. Further, they are readily available from HTL Telemanagement so that H&L have chosen to falsely accuse me of causing nonperformance on their part. It is shocking to be accused of withholding data by economists who rely only on "*proprietary data* for AT&T." (H&L, p. 67, emphasis added.) H&L do not reveal even the most basic information about their source materials. This is to falsely accuse another of unscientific behavior to which one is prone.

6. *H&L state that "a focus on ARPM reveals the obvious upward bias in MacAvoy's estimates of 'prices.' Proprietary data submitted by AT&T indicate that ARPM measures for all switched services were $0.181 per minute in 1994, $0.172 per minute in 1995, and $0.169 per minute in 1996."* (H&L, p. 68, and note 86.) In the attached Reply Affidavit, I demonstrate that, even assuming the validity of ARPM as a measure of price, the ARPM-cost margin *increased* in the data reported by H&L, which cover the period 1984